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Effect of Dietary β -Glucans on Growth Performance in Developing Chickens

A.S. Leaflet R2331

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Summary and Implications

The effects of dietary β -glucans on chickens from 3 distinct genetic lines were measured from weeks 3 through 8 of age. At 8 weeks of age, broilers fed the β -glucan diet had a higher breast-to-body-weight ratio than those fed the control diet, without a difference in feed efficiency. Evaluation of the effect of β -glucans as dietary supplements is important to determine the benefits of their utilization in poultry diets.

Introduction

Dietary enhancement of immune function is of interest to the animal production industry as an alternative to antibiotic growth promoters. Enhancing the immune system prevents loss of production due to infection by reducing the number of animals affected by a pathogen and the period of time required for recovery. β -Glucans from fungi such as baker's yeast have been proposed as a dietary immunomodulator for use in animals and humans.

An ideal dietary immunomodulator should have positive effects on the immune system of an animal without negatively affecting important production traits. Dietary immunomodulators could be useful in young animals, which have not developed a mature immune response.

Materials and Methods

Birds placed in this experiment were from 3 genetic lines: inbred Leghorn and Fayoumi lines and a relatively outbred broiler line. At 3 weeks of age, 16 individuals from each line were subdivided into 2 groups per line based on genetic background, body weight, and sex, with equal representation of these factors in each group. These groups were then fed either a control diet or a diet containing 0.1% β -glucans. These diets were identical in all other factors, with cornstarch used in place of β -glucans in the control diet. Birds had free access to these diets from day 22 to day 56 of age. Weight gain was monitored for each individual weekly and feed consumption was monitored for each group, also weekly. At day 56, total body weight and left breast muscle (pectoralis major and minor) weight were measured in all individuals. Statistical analysis was done by one-way ANOVA with line and diet as fixed effects.

Results and Discussion

Broilers receiving the β -glucan diet had higher breast-to-body mass ratios at day 56 of age (Figure 1). Feed consumption and total body weight were not significantly different from the control group. Body weight, feed consumption and carcass differences were not observed between diet treatments in either of the smaller and slower developing layer lines.

These data suggest a beneficial modulation of carcass composition into high-value breast muscle in broilers, without a change in feed efficiency. Further testing of β -glucans in chickens is needed to determine if the benefits of feeding these compounds make them an effective alternative to dietary antibiotics in immune enhancement.

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Figure 1. Percent breast weight per 100 g body weight for each dietary treatment within lines. Dots represent data from individuals and dashes represent treatment group means.



